

### **REMARKS**

Reconsideration of the present application, as amended, is respectfully requested.

### **STATUS OF THE CLAIMS**

Claims 1, 2, 4-6, 8-13, 15 and 18 are pending, claims 1, 2, 5, 6 and 9-12 having been amended herein.

Claims 7, 14, 17 have been previously canceled without prejudice.

Claim 3 and 16 have been canceled herein without prejudice.

Claim 18 has been added to highlight inventive features of the claimed invention. No new matter has been added.

Claims 1-6, 8-13 and 15-16 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite.

Claims 1-6, 8-13 and 15-16 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Koivukunnas et al. (5,438,920) in view of Schiel (5,226,357).

### **REJECTION UNDER 35 U.S.C. §112, SECOND PARAGRAPH**

Claims 1-6, 8-13, 15 and 16 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Claims 1 and 11 have been amended herein to more clearly recite the invention.

In view of the amendments to the claims it is submitted that the Examiner's rejections under 35 U.S.C. §112, second paragraph have been overcome.

**REJECTIONS UNDER 35 U.S.C. 35 U.S.C. §103(a)**

Claims 1-6, 8-13 and 15-16 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Koivukunnas et al. (5,438,920) in view of Schiel (5,226,357). The Examiner's rejections are respectfully traversed.

The claimed invention, as recited in amended claim 1, relates to a method for computing and regulating the distribution of linear load in a multi-nip calender and includes the step of assigning a value to at least one variable representing a physical property affecting the bending of each of the at least two intermediate rolls. The claimed invention also includes the steps of applying a first force to said at least two intermediate rolls by means of said variable-crown upper roll, applying a second force to said at least two intermediate rolls by means of said variable-crown lower roll and applying a support force to each one of said at least two intermediate rolls by means of said support cylinders. The present invention further includes the step of adjusting at least one of the following to place the set of rolls in a state of equilibrium and a predetermined state of deflection: the first force, the second force, at least one of the support forces and at least one of the weight forces exerted on each of said at least two intermediate rolls.

The claimed invention according to amended independent claim 11 recites an arrangement for computing and regulating the distribution of linear load in a multi-nip calender that includes a variable-crown upper roll that applies a first force to at least two intermediate cylinders and a variable-crown lower roll that applies a second force to the at least two intermediate cylinders. The at least two intermediate rolls have support cylinders, the support cylinders apply a support force to each one of the at least two intermediate rolls. The set of rolls have bending lines which are curved downward. The arrangement also includes an automation

system and a computing unit for assigning at least one value to a variable representing a physical property affecting the bending of each of the at least two intermediate rolls and for adjusting at least one of the following to place the set of rolls in a state of equilibrium and a predetermined state of deflection: the first force, the second force, at least one of the support forces and at least one of the weight forces exerted on each of the at least two intermediate rolls.

Koivukunnas et al. shows a method and apparatus, in which a web to be calendered is passed through nips formed by a variable-crown upper roll, a variable-crown lower roll, and by at least two intermediate rolls arranged between the upper and lower rolls. Such rolls are used as the intermediate rolls in which the form of the natural deflection line produced by their own gravity is substantially equal. However, does not teach or suggest an arrangement for computing and regulating the distribution of linear load in a multi-nip calender as recited in claim 1 of the claimed invention. Specifically, Koivukunnas et al. does not teach or suggest assigning a value to at least one variable representing a physical property affecting the bending of each of said at least two intermediate rolls as recited in amended independent claim 1 of the present invention. Nor does Koivukunnas et al. teach or suggest an automation system and a computing unit for assigning at least one value to a variable representing a physical property affecting the bending of each of said at least two intermediate rolls as recited in amended independent claim 11 of the present invention. Thus, Koivukunnas et al. fails to teach or suggest the claimed invention as recited in claims 1 and 11.

Schiel ('357) shows a multi-roll calender, in which a sag-compensation roll is used as *the bottom roll of the calender only* (column 5, lines 5-7). The sag-compensation roll is of the type in which a sag thereof is compensated by an internal pressure, i.e there is a pressurized chamber

in the roll. Conversely, the arrangement to which the present invention is directed includes a variable-crown upper roll that applies a first force to the at least two intermediate rolls and a variable-crown lower roll that applies a second force to the at least two intermediate rolls. In addition the method according to the present invention includes the step of adjusting at least one of the following to place the set of rolls in a state of equilibrium and a predetermined state of deflection: the first force, the second force, at least one of the support forces and at least one of the weight forces exerted on each of said at least two intermediate rolls. It is submitted that Schiel does not disclose variable-crown upper roll that applies a first force to the at least two intermediate rolls and a variable-crown lower roll that applies a second force to the at least two intermediate rolls in the manner of the claimed invention. Further it is submitted that Schiel does not disclose adjusting at least one of the following to place the set of rolls in a state of equilibrium and a predetermined state of deflection: the first force, the second force, at least one of the support forces and at least one of the weight forces exerted on each of said at least two intermediate rolls in the manner of the claimed invention. Accordingly, Schiel fails to teach or suggest the claimed invention.

Additionally, it is submitted that the teachings of Koivukunnas et al. cannot be combined with the teachings of Schiel ('357) to thereby render the claimed invention obvious. Schiel states that "The control computer 7 is programmed in accordance with the complex system of formulas of the multi-roll calender 1 which formulas associate the values of the weight forces, the linear forces resulting therefrom, and the sag-free linear forces." (Column 3, lines 31-35). However, nowhere in Schiel does it disclose assigning a value to at least one variable representing a physical property affecting the bending of each of the at least two intermediate rolls and adjusting

at least one of the first force, the second force, at least one of the support forces and at least one of the weight forces exerted on each of said at least two intermediate rolls as recited in amended independent claim 1. Moreover, Schiel does not disclose in any fashion an automation system and a computing unit for assigning at least one value to a variable representing a physical property affecting the bending of each of said at least two intermediate rolls and for adjusting at least one of the first force, the second force, at least one of the support forces and at least one of the weight forces exerted on each of said at least two intermediate rolls as recited in amended independent claim 11 of the present invention. Thus, even if Schiel was combined with Koivukunnas et al., it would still fail to teach or suggest every feature of the claimed invention.

### **CONCLUSION**

It is respectfully submitted, that in view of the amendments made to the claims and in view of the arguments presented above, that the Examiners's rejection of the claims have been overcome and should be withdrawn.


It is believed that this communication is being timely submitted. However, in the event that it is untimely and extension fees are required, this is to be considered a petition for extension and the Commissioner is hereby authorized to charge any requisite fee to Deposit Account No. 50-0518.

According to currently recommended Patent Office policy, the Examiner is specifically authorized to contact the undersigned in the event that a telephonic interview would advance the prosecution of this application.

An early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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